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The dental public health implications of cosmetic dentistry: a scoping review of the literature

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Introduction: The popularity of cosmetic surgery has seen a rapid increase recently, with the trend mirrored in dentistry. The Department of Health expressed concerns about the potential for biological and psychosocial harm of these cosmetic procedures. Furthermore, the dental public health implications (DPH) of the growing uptake of cosmetic dental procedures have not been explored. ***Objectives:*** Conduct a scoping review to explore the DPH implications of cosmetic dentistry and identify gaps for future research. ***Methods:*** A five-stage scoping review was conducted of studies identified using the search terms cosmetic AND dentistry. Data from the studies meeting the inclusion criteria were extracted, collated and summarised into themes. ***Results:*** Fifty-seven papers met the inclusion criteria (11 cross-sectional studies, 10 literature reviews and 36 opinion pieces). The DPH implications were summarised into five emergent themes: dento-legal and ethical, marketing, psychosocial, biological and workforce. These themes revealed patients' increased expectations, expanding commercialisation of the profession, psychological risks to vulnerable patients, the iatrogenic consequences of invasive cosmetic dental procedures and workforce implications of the current trends. ***Conclusion:*** The scoping review found that existing literature on cosmetic dentistry is predominately anecdotal - professional opinions and discussions. Despite this, our findings demonstrated workforce training and governance implications due to increased demand for cosmetic dentistry. Further empirical research is needed to understand the DPH implications of the increasing demand and uptake of cosmetic dental procedures to guide evidence-based policy to safeguard patients and improve the quality of dental services.

Key words: *cosmetic dentistry, aesthetic, dentistry, public health, scoping review, marketing, ethical issues, tooth whitening*

Introduction

Dental public health (DPH) has been defined as: *the science and practice of preventing oral disease, promoting oral health and improving quality of life through the organised efforts of society* (Downer *et al*., 1994) and encompasses psychosocial aspects of oral health. Society's efforts to improve populations' oral health require consideration to be given to the planning and management of health services, oral health inequalities and social justice. Of the several definitions of cosmetic dentistry, this review considers the New Zealand Dental Council (2009) one to be the most appropriate as it acknowledges both the biological and psychosocial nature of cosmetic dentistry. Cosmetic dentistry within this review is defined as: *Oral or maxillofacial procedures that revise or change the appearance, colour, texture, structure or position of orofacial hard and/or soft tissues with the sole intention of improving the patient's appearance or self-esteem. Cosmetic procedures are usually elective and involve procedures (in the absence of pathology) with the primary purpose of improving the patient's appearance.*

Some cosmetic dental procedures can be categorised as 'non-surgical' i.e. those that alter tooth colour, shape or position with minimal damage to the underlying tooth structure and include orthodontics, tooth-bleaching and direct adhesive restorations. 'Surgical' cosmetic dental procedures, though, cause irreversible change to the tooth, soft tissue and/or bony structures and include veneers, crowns, bridges, implants, surgical crown lengthening, aesthetic gingival procedures and oral and maxillofacial surgery.

Dental cosmetic procedures have seen an increase of 50% in the last five years (General Dental Council, GDC, 2014a). The UK dental industry is worth approximately £5.7 billion pounds, 42.5% of which is provided privately; most cosmetic dentistry is likely to be undertaken within this private sector (Office of Fair Trading, 2012).

There are many reasons for the increased demand and provision of cosmetic dental care such as the decline in dental caries in developed countries, the increasing importance societies place on appearance, and the influence of the media (Department of Health, 2009; Theobald *et al.*, 2006). A New Zealand survey found that 85% of general dental practitioners felt that patients desiring cosmetic dentistry had mentioned reality television programmes like "Extreme Makeover", which televise people having surgical cosmetic procedures (Theobald *et al.*, 2006). It has also been suggested that people who watch reality television shows where celebrities have undergone cosmetic dentistry may be more likely to normalise such procedures and perceive them as "less risky" (Creative Research, 2012).

In addition to media exposure, other factors identified to influence desires to undergo cosmetic procedures included being female, younger, having lower education levels and exposure to elective cosmetic procedures through friends and family (Brown *et al.*, 2007; Vallittu *et al.*, 1996).

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As well as the young, the "baby-boomer" generation (ages 55-65 years) have high expectations to preserve not merely a functional, but also an aesthetically pleasing dentition; maintaining and improving ones smile has been suggested as a sign of "successful ageing". An online survey found that about half of 55-65 year olds would opt to have their teeth bleached and 42% expressed a desire to change their smile (Wulfman *et al.*, 2010).

Cosmetic dental procedures can have adverse consequences, particularly when there is irreversible removal of sound tooth tissue; placing teeth into the 'restorative failure cycle'. The sequelae of invasive cosmetic procedures such as full coverage crowns and bridges can include pain, pulpal devitalisation, dental abscess formation and sepsis; teeth may subsequently require endodontic treatment or extraction (Roberts, 1970; Saunders and Saunders, 1998).

To obtain informed consent the dental professional must outline the benefits and risks of any planned procedure (King, 2002). Consequently, to obtain informed, autonomous consent the dental professional must determine the relative psychosocial benefits of cosmetic procedures, weighing these against risks of treatment and potential failure, and convey this information to the patient in a neutral fashion.

Biomedical ethical principles are grouped into: Beneficence – "the importance of doing good", Non-maleficence – "not harming others", Autonomy – "respect for a person's capacity to determine what happens to them", and Justice – "a call for patients to be treated without prejudice" (King, 2002). These ethical principles may conflict when planning cosmetic dental procedures: autonomously requested elective cosmetic procedures may harm a patient's oral health. Preserving patient autonomy is seen as central in contemporary medical practice where patients are informed through traditional and digital media (De Roubaix, 2010). This can sometimes make problems in reconciling the principles of beneficence and non-maleficence whilst preserving patient autonomy.

The recent Department of Health, DH, review of cosmetic interventions described concerns for appropriate professional standards, quality control, and a need to implement relevant monitoring of patient outcomes. The review also noted similar concerns with cosmetic dentistry and recommended a specific review of this area (Keogh, 2013). Despite this recommendation and the increasing provision of cosmetic dental procedures, there has been little exploration of the public health implications of cosmetic dentistry. Therefore, a scoping review was conducted to analyse and synthesise the existing literature on cosmetic dentistry (Colquhoun *et al.*, 2014).

The aim of this scoping review was to describe the available literature related to the DPH implications of cosmetic dentistry in adults and to identify significant gaps in the current literature which would benefit from further research.

Method

This literature review was conducted using the scoping framework proposed by Arksey and O'Malley (2005) with the addition suggested by Levac and colleagues (2010) which improve clarity of the research question by considering the target population, outcomes, purpose and search strategy. There was joint decision-making between two researchers when deciding the outcome variables and inclusion/exclusion criteria.

A broad based search was used with the terms "cosmetic AND dentistry": first as a pilot with the electronic database Scopus to confirm the appropriateness of the search terms to generate results relevant to the research question. To ensure the appropriateness of the selection criteria, two reviewers assessed ten articles from the pilot search. The number of included papers was found to be unmanageable, thus the selection criteria were modified to include only papers from the past 20 years. Trends in cosmetic dentistry change rapidly and older papers were found to be anachronistic by modern standards.

Regarding selection criteria, the focus of the review being common cosmetic dental procedures in general practice amongst adults, specialist maxillofacial procedures were not included. Implants were also excluded as they are commonly employed to replace teeth missing due to pathology, trauma or congenital absence. Articles were excluded if they were related to childhood orthodontics, orthognathic oral and maxillofacial surgery, extra-oral facial aesthetic techniques such as Botox or dermal fillers, uncommon techniques used for cosmetic dentistry i.e. lasers, and advertisements of cosmetic dental products. Papers without an abstract available online were also excluded unless the reviewers assessed the title as unequivocally relevant to the review.

The inclusion criteria were: English language (or English translated) randomised controlled trials, case-control, cohort, cross sectional studies and expert opinion. The articles included the selected keywords and highlighted the DPH implications of: veneers, crowns, bridges, teeth whitening, composite restorations and adult orthodontics. Scopus, Web of Science and Medline via Ovid were searched using the terms "cosmetic AND dentistry" from 1st June 1994 to 31st May 2014. Two reviewers independently applied the inclusion and exclusion criteria to the search results.

The articles retrieved were read for topics related to DPH, these included: concepts of health, health need, quality, determinants of health, inequalities in oral health, preventive approaches, evidence-based practice, epidemiology, demography, health-services planning and management, health promotion, medical statistics, sociology, psychology, health economics, ethics and financing (Daly et al., 2013)

Two researchers designed the data charting form which was piloted on five papers to assess its applicability to the variety of retrieved study types. Each article was then categorised according to its study type and a summary of the findings or main discussion points were extracted. From these data, themes were identified which characterised the main DPH implications of cosmetic dentistry.

Results

Fifty-seven articles met the inclusion criteria (Figure 1). Their authors were mostly from the USA (n=28 papers) or UK (n=19) plus another one UK-USA collaboration with other contributions from Canada (n=4), Australia (n=2), New Zealand (n=1), France (n=1) and the Netherlands (n=1). Eleven were cross-sectional studies, 10 literature reviews and 36 opinion pieces. Five themes emerged from the data: dento-legal and ethical considerations, marketing, psychological impacts on patients, the biological impact on patients' teeth and workforce implications.

Dento-legal and ethical considerations

Dento-legal and ethical considerations were a recurring theme with a range of ethical positions discussed ranging from suggestions that teeth whitening was ethical due to its non-invasive and predictable nature, to others warning of the ethical implications of aggressive tooth substance removal for cosmetic procedures (Ahmad, 2010). Multiple authors suggested the use of minimally invasive techniques which were still aesthetically acceptable for patients (Kelleher, 2012; Simonsen, 2007).

Empirical data also demonstrated there was a spectrum of what is considered to be 'ethical' cosmetic dentistry, with teeth whitening being the most acceptable form of cosmetic dental treatment. A survey of dentists found they considered teeth whitening, orthodontics, and direct bonded restorations as 'ethical', whereas invasive procedures such as indirect porcelain veneers and replacement amalgams were considered less so (Christensen, 1994).

Patient safety was another ethical concern; discussion articles centred on the difficulties in monitoring and controlling the provision of teeth whitening treatments sold to salon-based clients (Mathewson and Rudkin, 2008). Besides these rhetorical opinions, empirical data also speculated on patient safety. A cross-sectional survey of 179 dental practices and 76 beauty salons in Portsmouth found that most used teeth whitening agents that contained a greater concentration of hydrogen peroxide than that permitted by the regulations enforced at that time; the Cosmetic Products (Safety) Regulations 2008. The subsequent European Cosmetics Regulation 1223/2009, have stipulated that tooth whitening products that release more than 0.1% hydrogen peroxide cannot be sold at retail level. "Tooth whitening products containing or releasing between 0.1% and 6% hydrogen peroxide can only be sold to dental practitioners" (GDC, 2014b). This survey may indicate that there is a failure to safeguard patients appropriately when faced with their cosmetic demands (Beckett, 2010).

Dento-legal recommendations for practitioners that emerged included the need to work within their professional knowledge and skills, comply with GDC standards and guidance, and keeping up-to-date (Ahmad, 2010; Maglad *et al.*, 2010). It was also advised that dentists should ensure that professional responsibilities to diagnose oral-health conditions are not abandoned for cosmetic procedures (Ahmad, 2010). Written consent and the need to update patient consent throughout protracted treatment plans were strongly advocated to avoid litigation (Kelleher *et al.*, 2012a).

Other discussions considered the challenge of patient communication (Maglad *et al.*, 2010), for example, the importance of clear communication, particularly the use of terms such as 'permanent' which practitioners were recommended to avoid due to the limited longevity of many cosmetic procedures. Another concern about 'communication' related to dentists' professional status and skills. It was recommended that those clinicians practicing cosmetic dentistry must honestly disclose their status as a general dentist; several authors warned against practitioners deceptively labelling themselves as specialists (Kelleher *et al.*, 2012b; Maihofer, 2009; Rossi, 2006). The use of unrecognised credentials by cosmetic practitioners and the exaggeration of skills was also highlighted (Simonsen, 2007).

Finally, commercialisation of the profession and the potential professional conflict was raised as an ethical consideration. This conflict was described as 'commerce versus care' with claims that some practitioners were putting commercial interests before patient care by providing unnecessary treatment, excessive charges, and failing to refer to specialists (Simonsen, 2007). It has been suggested that this professional conflict may diminish the prestige of dentists as true healthcare professionals (Mulcahy, 2000). But, an alternative opinion (Glick, 2000) suggested that patients are educated, aware of their desires and will have potentially researched their options. Glick commented that all areas of dental professional practice had concerns about over-treatment and over-charging - this was not exclusive to cosmetic dentistry.

In summary, in the dento-legal and ethical considerations theme, key areas of concern identified were issues with communication, working within your own professional competence and the increasing commercialisation of dental care. These problems relate closely to the next theme of marketing and business strategies employed by dental practices.

Marketing

The theme of marketing captures the approaches described in the literature for dental professionals to increase the uptake of cosmetic dental procedures by their patients. These strategies included: 'educating' patients on the benefits of cosmetic dentistry (Levin, 2007a;b; Morley, 1994), offering financing options (Austin, 1994; Jameson, 2006), conducting cosmetic dental examinations, providing the dental team with 'smile-makeovers' (Austin, 1994; Blaes, 1998; Dickerson, 1997), improving the décor of a practice (Levin, 2007a; Morley, 1994), as well as *pull in* strategies, such as offering discounted teeth whitening as a gateway to patient acceptance of other cosmetic procedures (Blaes, 1998; Madow, 1997).

The use of a 'marketing consultant' was advocated to assist with 'creating sales literature' (Austin, 1994; Levin, 2007; Morley, 1994). 'Salesmanship' was a recommended new skill to be learned by dentists and their teams (Levin, 1994).

Levin (1994; 1996) predicted that the future of dentistry is to develop *boutique* practices for patients who simply want to be beautiful, and do not care about technical explanations. Gordon (2010) advised that the dental spa is the next industry-transformation for the dental practice which enables fully comprehensive holistic care from the dentist with a team including specialists in oral surgery, orthodontics, dermatology and plastic surgery.

Psychological impact

This theme identified the potential psychological benefits as well as risks for patients. It has been argued that cosmetic dentistry can psychologically benefit patients by addressing their dissatisfaction with their dental appearance. However, there are also risks of post-treatment dissatisfaction, especially for patients with body dysmorphic disorders.

Cosmetic procedures were seen to have some positive impacts on self-esteem. A survey of 44 people found that those who had had cosmetic dental procedures to rectify an aesthetic concern with their teeth scored higher on the body-esteem questionnaire than those who did not. However, there were also cautions in the included literature warning that patients who opt for elective cosmetic dental procedures may be more likely to suffer from anxiety, depression, body-area dissatisfaction or body-dysmorphic disorder, thus being at an increased risk of experiencing post-operative dissatisfaction (De Jongh *et al.*, 2008; Dowling *et al.*, 2010; Honigman *et al.*, 2011). A pre-operative screening questionnaire was identified in the data as a potential solution to these emerging problems with the questionnaire attempting to identify patients who would benefit from pre-operative counselling (Honigman *et al*., 2011).

Biological impact

The biological impacts of cosmetic dental procedures discussed in the included papers predominantly related to the longevity and risks associated with crowns, veneers, teeth whitening, bonding, and adult orthodontics. The need for subsequent replacements, repairs, maintenance, and the consequences of tooth tissue removal, treatment failure, and potential non-vitality were also highlighted (Kelleher *et al.*, 2012a).

As was discussed in the dento-legal and ethical considerations theme, the non-invasive nature of teeth whitening was considered to have fewer biological risks than alternative procedures (Ahmad, 2010; Blaes, 1998; Madow, 1997). Directly bonded adhesive restorations and orthodontics were also advocated due to their minimal need for tooth preparation when compared with indirect restorations (Ali *et al.*, 2013; Burke and Kelleher, 2009; Burke *et al.*, 2011; Kelleher, 2010). However, the adverse risks associated with teeth whitening were not unheeded. The potential complications of teeth sensitivity, gingival irritation, and pulpal damage of carious teeth were reported (Matthews, 2001). Commentators also discussed the possibility of relapse and tooth resorption associated with orthodontics (Chate, 2013).

Workforce

Finally, the implications for the workforce due to the increasing prevalence of cosmetic dentistry were discussed (Levin, 1997; Morley, 1997; 1999; Philips, 1998). It was suggested that the dental profession ought to plan for the appropriate capacity and skill-set required to meet the expanding cosmetic dentistry demands and expectations of an ageing population retaining their teeth (Morley, 1997; 1999; Philips, 1998). A literature review by Currie and colleagues (2012) comparing dental services in the UK and USA discussed the compelling decline in dental disease. This change had shifted dental service demands toward orthodontics and other cosmetic dental procedures.

Discussion

Our primary aim was to review the literature on cosmetic dentistry in order to describe the key DPH implications and identify areas for future research.

Five outcome themes emerged from the included articles: dento-legal and ethical considerations, marketing, psychological impacts, biological impacts and workforce. These themes were interrelated with some consistently reported areas of concern constituting the possible consequences of increased demands and expectations of an ageing population, training and skills of dental professionals, commercial advertising within dentistry, the psychological risks to vulnerable groups, iatrogenic damage, the acceptability of teeth whitening.

The dento-legal and ethical and marketing themes were intimately interrelated. The increasing demands of patients for cosmetic dental procedures were seen to foster an increasingly commercial culture within dentistry. Teeth whitening was largely seen as 'ethical' due to its predominantly non-invasive nature. However, the literature described the use of teeth whitening as a commonly employed promotional tool to encourage patients to have more invasive cosmetic dental procedures (Blaes, 1998; Madow, 1997).

Various marketing strategies were seen in the data to increase patient demand and uptake of cosmetic dental procedures including the use of professional marketing consultants (Austin, 1994; Levin, 2007; Morley, 1994), re-branding the dental practice as a spa (Gordon, 2010; Levin, 2007; Morley, 1994), using dental staff as advocates for treatments (Austin, 1994; Blaes, 1998; Dickerson, 1997), and creating a culture promoting the benefits of cosmetic dental procedures (Dickerson, 1997; Levin, 2007). There were ethical concerns articulated about the growing commercialisation of the dental profession fueling demand for cosmetic dental procedures (Mulcahy, 2000; Simonsen, 2007). It was argued that the commercial pressures faced by dental professionals has the potential to undermine the professionals' identity as true 'healthcare' practitioners (Mulcahy, 2000).

The notion of 'professional' duty and responsibility recurrently brought to the fore the issue of informed consent for cosmetic dentistry. There was a concern that dentists' were miscommunicating their credentials as 'cosmetic dentists' (Kelleher *et al.*, 2012b; Maihofer, 2009; Rossi, 2006) using unrecognised credentials and exaggerating their skills (Simonsen, 2007). Since 'cosmetic dentistry' is not a recognised specialty (Cannon, 2013), there are key gaps in the current governance paradigm for 'cosmetic dentists'. Standards and regulations need to be developed for cosmetic dentistry to register professionals, their qualifications and skills. This will allow patients to be better informed and improve patient safety. This approach chimes with the Department of Health review on cosmetic procedures about the need to develop appropriate professional standards and quality control (Keogh, 2013).

The increased commercialization of cosmetic dentistry described in the literature raises concerns about patient safety due to psychological risks to vulnerable group and the iatrogenic damage caused by dental procedures that may not be wholly necessary (Kelleher, 2012a). Vulnerable people of particular concern are those with body dysmorphic disorder, this cohort are nine times as likely to seek teeth whitening, and six times as likely to seek orthodontic treatment (De Jongh *et al*., 2008). Unfortunately, those with body dysmorphic disorder are also more likely to experience post-operative dissatisfaction due to unrealistic expectations of cosmetic procedures (De Jongh *et al.*, 2008). This again highlights concerns about informed consent and whether dental professionals have adequately assessed if these vulnerable groups have the requisite capacity to realistically weigh up the benefits and the risks of some cosmetic dental procedures.

Some dental professionals have argued that contemporary dentistry is becoming commercialised due to the evolving attitudes of patients who are increasingly, the demanding customers of services (GDC, 2014). Despite this, the GDC (2013) standards for the dental team mandate professionals to act in the best interests of patients. This includes ensuring informed consent by establishing patients understanding of the potential adverse consequences of their treatment choices. This is particularly relevant in cosmetic dentistry where it has been suggested that when considering cosmetic procedures, patients have a tendency to concentrate on the outcome; underplaying risks and neglecting to pay attention to the limitations of treatments (Keogh, 2013). However, currently there are no agreed standards for 'cosmetic dentists' guiding them to confirm adequately informed consent.

The literature suggests that vulnerable patients with anxiety, depression and body area dissatisfaction may benefit from a pre-operative screening questionnaire (Honigman *et al.*, 2011). However, further research to understand how to adequately obtain informed consent for cosmetic procedures is required to strengthen the current governance framework and formulate appropriate evidence-based guidance for dental professionals.

As well as addressing some ethical dilemmas, improving the framework for obtaining informed consent has the potential to reduce patient complaints and litigation through improved patient satisfaction and ultimately improved quality of services (Kelleher *et al.*, 2012a; b).

The data describes the increasing demands of patients, not only to retain their teeth but also to have invasive cosmetic procedures to obtain a beautiful smile. Thus, these heavily restored teeth in an ageing and demanding population with multiple co-morbidities are likely to pose particular challenges for the dental workforce (Lewis, 2011). The skills of the dental workforce need to be expanded to safely meet these complex challenges (Ahmad, 2010; Maglad *et al.*, 2010). Consequently, undergraduate and postgraduate dental education bodies need to be mindful of the diverse technical, communication and holistic patient management skills that 'cosmetic dentists' require when planning the curricula of dental professionals.

The iatrogenic damage caused by cosmetic dental procedures was predominantly reported in the themes of biological impacts and dento-legal and ethical considerations. There was a spectrum of acceptability of cosmetic dental procedures related to the level of their invasiveness. Therefore teeth whitening was consistently advocated in our findings due to its non-invasive nature (Ahmad, 2010; Blaes, 1998; Christensen, 1994; Madow, 1997). Directly bonded adhesive restorations and orthodontics were also favoured due to their reduced need for tooth preparation compared to indirect restorations (Ali *et al.*, 2013; Burke and Kelleher, 2009; Burke *et al.*, 2011; Kelleher, 2010).

The unregulated expanding practice of cosmetic dentistry is likely to lead to more dentists providing cosmetic dentistry, moving the workforce out of the NHS and causing problems with access. There may also be greater pressures on services to provide remedial work resulting from cosmetic treatment. Indeed, Keogh (2013) suggested that insurance products should be developed against failures of cosmetic treatment to protect patients and the public purse. This review shows that the profession is aware of the clinical iatrogenesis caused by cosmetic dental procedures with many discussions about patient safety and attempting conservative procedures. However, our data also reveals a broader social and cultural iatrogenesis (Illich, 1976) in which dental professionals are actively engaged with marketing cosmetic dental procedures to patients. Dental professional bodies need to develop standards of care for cosmetic dentistry and also standards for marketing.

The increased provision and uptake of cosmetic dentistry may lead to changes in social ideas of what is considered an 'acceptable' smile. The commercial culture where cosmetic procedures are increasingly acceptable is likely to create a feeling of exclusion of those from lower socio-economic backgrounds because of the high cost of procedures.

Although our findings revealed a number of issues that have implications for dental policy and practice in the areas of patient safety, workforce training and planning, and equity of dental access there were a number of limitations due to the nature of scoping reviews. A documented weakness of the scoping methodology is the difficulty in obtaining a favourable balance between feasibility, breadth and comprehensiveness (Levac *et al.*, 2010). Consequently, the authors took a pragmatic approach and only included English language papers. To include the appropriate breadth of professional perspectives, opinions were included and quality assessment was not conducted. Most of the papers included were opinion pieces or literature reviews with only 11 empirical cross-sectional studies.

The findings of this scoping review suggest that future research in this area should include empirical research on the impacts of increased provision of cosmetic dentistry on patient autonomy, patient safety, the provision of complex care for an ageing population, training needs of the dental workforce, equity of dental access and perceptions of dental need. Longitudinal studies of the biological and psychological impacts of cosmetic procedures will help to ascertain a clearer understanding of the benefits and disadvantages of treatments.

The current governance paradigm needs to be strengthened to provide appropriate professional standards and quality control to obtain fully informed consent from patients. Addressing some of the research gaps identified in this review will also allow DPH practitioners to advocate evidence-based policy decisions to appropriately orientate services, plan for an adequately trained workforce, and strengthen governance structures to improve the quality of services.

Conclusion

Five main themes for the DPH implications of cosmetic dentistry were derived from the scoping review: dento-legal and ethical considerations, marketing, psychological impacts, biological impacts and workforce.

Our data points to particular challenges faced by dental professionals and DPH practitioners to provide quality services in an increasingly commercialised environment.

A key area for concern was obtaining informed consent for cosmetic procedures, especially from vulnerable groups. The reviewers echo the Department of Health's recommendations that dental professional bodies need to work toward empowering the public to make informed decisions. There is a need to develop appropriate professional standards for cosmetic dental treatment as well as appropriate marketing.

Workforce education and planning was a key DPH consideration that emerged from this review. The increasing demands of an ageing consumerist population with high aesthetic demands poses challenges for dental professional bodies to appropriately train dental professionals and plan a socially acceptable workforce.

Most of the findings in this review are based upon professional discussions. Further empirical research is needed to inform evidence-based policies to strengthen the current governance structures, adequately train the workforce, and appropriately orientate services to meet the changing demands of patients.

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